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The Use of Identical Twins in Investigations
on the Feeding of Thyroprotein 1/

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The studies on the effects of feeding thyroprotein to lactating dairy cows over the major portion of a lactating period have been continued on a small scale. This investigation employed identical twins in which one member of the set received thyroprotein. In general the observations confirm our previous results that were obtained when thyroprotein was fed under similar conditions to unrelated animals.

In this experiment thyroprotein was fed to one member in each of the three sets of identical twins and one set of triplets. It was fed from the 50th to the 310th day of the first lactation. During this period total digestible nutrients (TDN) were offered at the rate of 125% of Morrison's maximum requirement to both members of each set. The third member in the set of triplets was fed TDN at 100% of requirement.

Data on milk production, fat test, average rate of feed consumption, efficiency of milk production and body weight changes are presented in table 1, for the entire lactation and for the segment during which thyroprotein was fed.

Milk and 4% fat corrected milk (FCM) production were greatest for the control animals in three out of the four sets of pair-mates used in this experiment. Average fat test was highest for the animal receiving thyroprotein in all four comparisons. The average rate of feed intake for the entire lactation was practically the same for all four pairs. The ratio of FCM produced to TDN consumed was not appreciably different when the large differences in body weight changes were ignored but when body weight changes were considered, as they should be, a decrease in efficiency of milk production was noted in all four animals that received thyroprotein. The feeding of thyroprotein caused a large decrease in body weight even when this large amount of extra feed was offered. Only two of these four animals had regained their initial weight by the end of the lactation period and all four animals receiving thyroprotein were markedly below their pair-mates in body weight.

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Table 1

Milk production, its efficiency, body weight changes and rate of feeding cows in which one member of an identical set was fed thyroprotein from the 50th to the 310th day of the lactation.

0 - 305 day record									
Set No.	Treatment	Production				Rate of consumption %	Efficiency corrected for weight change		body weight change lb.
		Milk lb.	Test %	B.F. lb.	FCM lb.		FCM/lb. TDN	FCM/lb. TDN	
1	Control	10265	3.77	387	9914	105	1.61	1.80	+182
	Thyro.	9880	4.00	395	9883	110	1.54	1.65	+126
		+ 385	-.23	- 8	+ 31	- 5	+.07	+.15	+ 56
2	Control	10580	3.48	368	9752	105	1.67	1.94	+224
	Thyro.	11060	3.86	427	10827	104	1.83	1.77	- 71
		- 480	-.38	-59	-1075	+ 1	-.16	+.17	+295
3	Control	9073	3.46	314	8342	108	1.45	1.57	+129
	Thyro.	7374	3.84	283	7195	110	1.44	1.34	-130
		+1699	-.38	+31	+1147	- 2	+.01	+.23	+259
4	Control	9221	3.92	361	9110	93	1.78	1.98	+146
	Control	11686	3.72	435	11195	111	1.69	1.92	+226
	Thyro.	9820	4.11	404	9988	109	1.67	1.68	+ 13
		+1866	-.39	+31	+1205	+ 2	+.02	+.24	+213
Average difference in 4 sets		+ 868	-.35	- 2	+ 327	- 1	-.01	+.20	+206

50 - 310 day record									
1	Control	8542	3.77	322	8251	112	1.50	1.81	+259
	Thyro.	7930	4.06	322	7998	119	1.39	1.57	+181
		+ 612	-.29	0	+ 253	- 7	+.11	+.24	+ 78
2	Control	8481	3.37	286	7683	109	1.57	1.85	+205
	Thyro	8757	3.86	338	8571	108	1.72	1.65	- 71
		- 276	-.49	-52	-888	+ 1	-.15	+.20	+276
3	Control	6766	3.31	224	6067	116	1.22	1.41	+183
	Thyro.	4611	3.87	178	4520	121	1.11	1.08	- 52
		+2155	-.56	+46	+1547	- 5	+.11	+.33	+235
4	Control	7294	3.96	289	7253	96	1.67	1.90	+148
	Control	9678	3.70	358	9238	116	1.55	1.78	+214
	Thyro.	7642	4.26	326	7943	114	1.52	1.52	+ 6
		+2036	-.56	+32	+1295	+ 2	+.03	+.26	+208
Average difference in 4 sets		+1132	-.48	+65	+ 552	- 2	+.02	+.26	+199

Other observations indicate that older cows in later lactations have not lost as much body weight as did the animals in this experiment. However, older cows that received less TDN than a 125% of requirement have shown the same excessive body weight losses.

Milk production has usually been found to be increased for a period of 20 to 60 days after initiating thyroprotein feeding and then it usually declines at a rapid rate. After mid-lactation milk production was usually below the level found in control cows receiving thyroprotein. The amount of increase in milk production has shown a great variation between different cows which indicates that not all cows in a herd will respond when given the material.

These and other experiments in which thyroprotein has been fed have indicated that there were no serious adverse effects on the health of the cows fed the material although some cows are more nervous when they are receiving thyroprotein.

As a result of this and our previous experiments it appears that it is not a desirable practice to feed thyroprotein to the lactating cow for the greater part of a lactation period. A probable practical use of thyroprotein is to feed it for short periods of time to selected cows in the proper season and at the proper stage of lactation. Experiments are in progress on these points.

A most interesting and important finding in this experiment was the difference in the amount of milk produced by the control animals in the set of triplets that were fed at different rates of intake. One animal consumed TDN at 111% of requirement and produced over 2000 more pounds of milk than her pair-mate that consumed TDN at 93% of her requirement. The differences in efficiency of milk production and body weight changes also were influenced in the directions expected.



